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(54) **MAGNETIC-INTERFERENCE-FREE
SURGICAL PROSTHESES**

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600/12; 607/60

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(57)

ABSTRACT

Interference-free coil systems are coil systems having at
least two coils which are identical in terms of inductance.
These coils are arranged such that their magnetic fields are
antiparallel to one another. Consequently, induced voltages
within the coils are substantially eliminated when the coils
are exposed to a homogeneous electromagnetic field. If
exposed to a nonhomogeneous electromagnetic field,
however, a net voltage is induced and enables the extraction
of data and power. Reed switch configurations in the
implantable prostheses protect against induced voltages
caused by the radio frequency field generated by an MR
imager when the reed switches are mounted parallel to the
plane of a receiver. Reed switch configuration may be used
to disconnect, de-tune, or short circuit a receiver. For
example, they may be used to disconnect the receiver
diodes. Some magnet configurations reduce torque caused
by an external magnetic field and prevent demagnetization
when disposed within, outside, or partially within an
implantable prosthesis. Magnets which align with the exter-
nal magnetic field also reduce the torque caused by the field
and prevent demagnetization.

5 Claims, 6 Drawing Sheets

